

# **Technical Report 1276**

## **Measuring Cross-Cultural Competence in Soldiers and Cadets: A Comparison of Existing Instruments**

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# MEASURING CROSS-CULTURAL COMPETENCE IN SOLDIERS AND CADETS: A COMPARISON OF EXISTING INSTRUMENTS

## EXECUTIVE SUMMARY

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### Research Requirement:

The Army and other Services have identified cultural and linguistic capabilities that will better enable military personnel to operate in foreign cultures and other multicultural contexts. Such cultural training and development initiatives will require assessment tools that measure progress in cultural learning and can help identify individuals with high intercultural performance potential. The goal of the present research was to identify candidate off-the-shelf metrics for constructs related to cross-cultural competence and to examine the properties of the measures in an Army sample.

### Procedure:

Cadets at the U.S. Military Academy and active-duty Soldiers completed the Cultural Intelligence Scale (CQS), the Multicultural Personality Questionnaire (MPQ), and the Intercultural Development Inventory (IDI), along with questions about their intercultural experiences. Analyses examined the relationships among the three measures, relationships with biographical variables (e.g., foreign language proficiency), and relationships with intercultural efficacy.

### Findings:

Results showed substantial convergence among the three measures, particularly with regard to affective and motivational aspects of cross-cultural competence. The measures also correlated with biographical variables previously linked with cross-cultural competence, including foreign language proficiency and intercultural interaction experiences. Results also indicated that officers have higher levels of intercultural development and traits than NCOs. Current findings and past research suggest that the MPQ in particular shows promise, though further research is needed to determine its suitability for measuring dynamic aspects of cross-cultural competence that can be influenced through training and education.

### Utilization and Dissemination of Findings:

These results can inform the development of measures of cultural learning and cross-cultural competence that are relevant for military personnel and their missions. This research can also inform training and development programs for cultural and interpersonal skills. Findings highlight the need for assessment methods other than self-report and for further research on the performance demands on Soldiers performing missions with a socio-cultural component.





# MEASURING CROSS-CULTURAL COMPETENCE IN SOLDIERS AND CADETS: A COMPARISON OF EXISTING INSTRUMENTS

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## **Measuring Cross-Cultural Competence in Soldiers and Cadets: A Comparison of Existing Instruments**

In recent years, the Army and other Services have identified cultural and linguistic capabilities that will better enable Service members to operate in foreign cultures and other multicultural contexts (Department of the Air Force, 2009; Department of the Army, 2009; Department of the Navy, 2008). Developing and sustaining these capabilities will require training, education, and developmental opportunities over an individual's career. To support these efforts, assessment tools will be needed to measure progress in cultural learning and to help identify individuals with high intercultural performance potential. Though assessment of cultural knowledge and skills in military personnel has been minimal, assessment tools for expatriate management and international student populations are widely available. The goal of the present research was to identify candidate off-the-shelf metrics for potential use with Soldiers and to examine the properties of these measures in preliminary empirical research.

We focus here on assessing culture-general contributors to effective intercultural outcomes. Culture-general attributes and competencies facilitate performance in any multicultural setting, whereas regional knowledge and skills contribute to performance in a specific culture. Though assessment of regional or culture-specific knowledge is also needed, no widely-accepted taxonomies or measures for culture-specific capabilities exist in the research literature<sup>1</sup>.

In contrast, several measures have been developed to assess culture-general attitudes, skills, and knowledge – or cross-cultural competence. These attributes have shown contributions to both adjustment and performance outcomes in different expatriate populations (see Abbe, Gulick, & Herman, 2007, for a detailed review). Though other expatriate roles differ in important ways from the role of military personnel working overseas, there is also substantial overlap. For example, similar to expatriate managers, international development personnel, and Peace Corps volunteers, military personnel conducting stability, security, transition, and reconstruction operations are routinely required to work closely with host nation security forces or civilian government representatives.

The military role is further characterized by uncertainty about the cultural context for future operations. Army personnel may deploy to multiple countries and regions over a career, and the Army cannot predict with certainty the location of future conflicts. Conflicts often occur among culturally and ethnically diverse populations. As a result, culture-general attributes are particularly important for Soldiers and leaders. Culture-general abilities would potentially enhance the acquisition and application of culture-specific knowledge and allow for easier transition between cultures.

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<sup>1</sup> There are some promising approaches to assessing culture-specific capabilities, such as assessing understanding of nonverbal cues in a foreign culture (Molinsky, Krabbenhoft, Ambady, & Choi, 2005; Matsumoto, Yoo, Hirayama, & Petrova, 2005) or attitudes toward specific cultural groups using Implicit Association Tests (e.g., Park, Felix, & Lee, 2007).

Successful achievement of organizational goals requires appropriate, competent personnel. However, individuals possess differential abilities to operate effectively in intercultural situations (Black, Mendenhall, & Oddou, 1991; Shaffer, Harrison, Gregerson, Black, & Ferzandi, 2006). An organization can attain the human capabilities needed for these functions in several different ways, such as through selection and assignment, training and development, or performance aids. An organization could employ either an interculturally-focused personnel selection program or a training and development program to fulfill the need for culturally competent personnel, or use some combination of these approaches.

Both types of programs require assessment of individuals' current abilities to succeed in a cross-cultural setting. For a selection program, assessment allows identification of individuals who satisfy certain cross-cultural competence criteria. Training and development programs require the assessment of individuals' current state of cross-cultural competence in order to identify the competency gaps on which to train. Furthermore, training and development programs utilize assessment to gauge progress toward the target learning outcomes (Kraiger, Ford, & Salas, 1993). For example, post-training knowledge, skills, and abilities can be compared with those from pre-training assessment (Schneider, Guthrie, & Olian, 1988).

Ultimately, training and developing personnel for missions with a sociocultural component may demand different measures than those for selection and assignment. However, both functions require initial efforts to define and assess the relevant individual characteristics and learning outcomes. Investigating measures developed for related purposes can help in determining the needs for and gaps in assessing cultural capabilities in military personnel, who may present some unique challenges requiring different assessment approaches. For example, Soldiers' intercultural contact often takes place under highly stressful conditions. In addition, Soldiers and other military personnel may show socially desirable responding to a higher degree than other populations, if lowered expectations of privacy increase impression management.

### **Measures Previously Developed for Military Personnel**

Measures of culture-general skills and attributes have been developed for military applications in the past, though not widely adopted. One notable effort was led by the Navy. Early return of Navy personnel from overseas assignment prompted research in the 1970's on the characteristics of individuals who adjust successfully (e.g., Mozingo, 1974; Zuga, 1975). An estimated 6.05% of Navy personnel failed to complete an overseas assignment in 1974 (Benson, Hare, & Tucker, 1980). Though that percentage later dropped due to improved screening procedures (e.g., screening out individuals with medical problems or poor performance, Benson et al., 1980), a later study in fiscal year 89 indicated that 4.4% of Navy personnel assigned overseas returned early due to screening failure (Archer & Walker, 1990). Given the costs associated with early return and replacement of those personnel, distinguishing individuals who adjust successfully from those who do not is of operational importance.

To address the problem of early return, researchers developed the Navy Overseas Assignment Inventory (Benson et al., 1980) and the Cross-Cultural Interaction Inventory (Yellen & Mumford, 1975). The Cross-Cultural Interaction Inventory (CCII) resulted from selecting

items from the Navy Overseas Assignment Inventory that performed best in identifying Navy personnel who adjusted successfully to their assignment to Japan. The CCII included primarily biographical and attitudinal questions that distinguished successful adjusters from unsuccessful adjusters, as indicated by peer and command nominations. Overall, attitudes and other attributes were better than biographical variables at identifying successful adjusters. These attributes included patience, intellectual curiosity, empathy, sociability, and acceptance of differences.

It should be noted that early tools such as the CCII tended to focus primarily on adjustment rather than performance outcomes, presumably because the host culture setting was perceived to be relevant to off-duty activities but not necessarily a direct aspect of operational duties. For unknown reasons, neither instrument was ultimately adopted by the Navy for use in pre-assignment screening (Archer & Walker, 1990).

More recently, the Cross-Cultural Adaptability Scale was developed to assess the suitability of military personnel for peacekeeping missions (Schmidtchen, 1997, as cited in Vanderpool, 2002). In responses from Australian and Canadian defense personnel, five factors were identified in this measure: interpersonal relations, openness to experience, organizational goals, personal goals, and problem solving. Though these factors comprise distinguishable aspects of intercultural competence for peacekeeping, research has not yet established that these factors are predictive of differing levels of performance during a peacekeeping mission. In other words, research has yet to link these dimensions with performance outcomes.

More recently, the Cross-Cultural Competence Inventory developed for military personnel, using measures of constructs relevant to cross-cultural performance, such as empathy, openness, willingness to engage, self-efficacy, self-regulation, and the need for closure (Ross, Thomson, McDonald, Fritzsche, & Le, 2010). In refining the measure, researchers have identified six dimensions of cross-cultural competence in military samples from all of the Services: cultural adaptability, determination, tolerance of uncertainty, self-presentation, mission focus, and engagement (Ross et al.). Validation efforts using supervisor ratings are ongoing.

Outside the defense context, a variety of measures have been developed for multicultural and expatriate settings (see Abbe, Gulick, Herman, 2007; Dodd, 2007 for reviews). Most of these measures have not been administered to military personnel. Due to differences in role and context, it is unclear whether the same indicators will be related to effective outcomes or whether the same structure will emerge. For example, though some overlap is likely, the characteristics important to being a good visiting student in a foreign country may be different from those needed by a Soldier conducting counter-insurgency operations abroad.

In addition, very little comparison among measures has been conducted. Research has not identified areas of overlap and discrepancy among different measures and the theoretical foundations on which they are based. Thus, researchers or practitioners interested in choosing a instrument for their purposes have little basis for making a decision. For this reason, we selected three measures of culture-general attributes hypothesized to enable successful performance and/or adjustment in intercultural settings. As in previous research, we limited the pool of candidate measures to those with evidence of validity reported in the research literature and to

those with wording and content domains that would be relevant for military personnel (Abbe et al., 2007).

## **Related Measures from the Literature**

Based on a previous review of measures of cross-cultural competence and related constructs (Abbe et al., 2007), we selected measures for the present research representing different theoretical approaches, which also showed promise for predicting behavior and performance, rather than only adjustment outcomes. These measures included trait-based, developmental, and multi-dimensional approaches to defining intercultural characteristics. Because the measures developed for military personnel, described above, were lacking either evidence of predictive validity or evidence of a relationship with performance outcomes, we did not include them in the present research.

The Multicultural Personality Questionnaire (MPQ) is a trait-based measure, which has been shown to predict both performance and adjustment for individuals living abroad. The Intercultural Development Inventory (IDI) is based on the developmental model of intercultural sensitivity (DMIS) and is one of the more commonly used by intercultural trainers and researchers (Paige, 2004). The Cultural Intelligence Scale (CQS) is based on a multi-dimensional theory of intercultural adaptation and is increasingly applied to international business and management.

The theoretical approaches underlying these measures reflect a progression from relatively stable predictors of intercultural adjustment and adaptation, in the case of the MPQ, to more dynamic predictors, in the case of the IDI and the CQS. Stable characteristics, like traits, may be assumed to be more relevant to selection, whereas more dynamic characteristics should be amenable to training and development. However, it is unclear how well existing measures reflect the different theoretical approaches on which they are based, and the degree of overlap among these measures is unknown.

### *Multicultural Personality Questionnaire*

The Multicultural Personality Questionnaire (MPQ) conceptualizes cross-cultural competence as a set of personality traits. The questionnaire is comprised of five subscales, including cultural empathy, emotional stability, social initiative, openmindedness, and flexibility (van der Zee & van Oudenhoven, 2000; van der Zee & van Oudenhoven, 2001).

Research on the MPQ has compared it to general personality constructs, namely the Big Five traits (openness, neuroticism, extraversion, agreeableness, and conscientiousness) (van der Zee & van Oudenhoven, 2000). A strong positive correlation was found between MPQ social initiative and extraversion, whereas a strong negative correlation was found between MPQ emotional stability and neuroticism. Moderate relationships were found between MPQ openmindedness and openness, between MPQ flexibility and extraversion, and between MPQ flexibility and openness. A number of studies have examined the incremental value of the MPQ



beyond general personality traits. Researchers have found that the MPQ significantly predicted additional variance in interest in an international career and international orientation beyond the Big Five personality traits (van der Zee & van Oudenhoven, 2000; Leone, van der Zee, van Oudenhoven, Perugini, & Ercolani, 2005).

The MPQ also predicts variability in behavioral competence beyond that predicted by the Big Five personality traits (van der Zee, Zaal, & Piekstra, 2003). In this research, behavioral competence was defined in terms of performance in an assessment center for personnel selection. Criteria included group leadership, initiative, listening, judging, persuading, and cooperating (van der Zee et al.). Other research has shown that MPQ traits are related to adjustment and performance outcomes in work teams characterized by cultural diversity (van der Zee, Atsma, & Brodbeck, 2004). Specifically, emotional stability was related to adjustment, and flexibility was related to individual academic performance.

Evidence also suggests that the MPQ predicts intercultural outcomes for individuals living abroad. The MPQ was found to predict adjustment in foreign students at an international business school (van Oudenhoven & van der Zee, 2002), students who participated in an international exchange program (Leong, 2007), and expatriate employees (van Oudenhoven, Mol, & van der Zee, 2003). More specifically, in the sample of expatriate employees, emotional stability emerged as the most consistent predictor of adjustment, and social initiative was also an important contributor (Leong; van Oudenhoven et al.). It has also been found that students with intentions to go abroad score higher on the MPQ (van der Zee & van Oudenhoven, 2001) and that those who score higher on the MPQ react more positively to potentially stressful situations (van der Zee, van Oudenhoven, & de Grijjs, 2004).

### *Intercultural Development Inventory*

The Intercultural Development Inventory (IDI) was created to measure an individual's orientation toward cultural difference as defined in the Developmental Model of Intercultural Sensitivity (DMIS; Bennett, 1986; 1993; 2004). This theory is intended to capture primarily cognitive aspects of intercultural competence, rather than attitudinal or behavioral (Hammer, Bennett, & Wiseman, 2003, p. 423). The IDI assesses stages in the DMIS that run along a continuum from ethnocentrism to ethnorelativism.

The first three stages are considered ethnocentric stages; these are denial (cultural differences are denied), defense (cultural differences are recognized but thought as inferior), and minimization (cultural differences are recognized but trivialized). A corresponding, yet opposite, phenomenon known as reversal may also occur in the defense stage. In reversal, cultural differences are recognized; however, the foreign culture is viewed as superior to one's own culture.

The remaining three stages are ethnorelative. These include acceptance (cultural differences are accepted), adaptation (one is able to adjust to cultural differences), and integration. This last stage is considered independent of the other stages. Integration is not necessarily more effective than adaptation, but is instead considered a change in identity

experienced by some individuals who regularly shift between two cultures. This stage may manifest as positive or negative depending on the experience of the individual.

The IDI is a 50-item paper-and-pencil questionnaire that is comprised of five subscales which represent the stages described above (Hammer et al., 2003). In order from ethnocentric to ethnorelative the subscales are as follows: defense and denial, reversal, minimization, acceptance/adaptation, and encapsulated marginality (measuring the negative form of integration). The model proposes that an individual will progress from an ethnocentric orientation to an ethnorelative one with the development of greater sensitivity.

Research using the IDI has found that intercultural experience is related to intercultural sensitivity. Olson and Kroeger (2001) found that university faculty and staff who had more experience abroad also scored higher on the IDI. This finding was also supported in a similar study using secondary school teachers (Mahon, 2009). Longitudinal studies on study abroad programs have also found similar results, such that after returning from studying abroad students' scores showed a decrease in reversal and an increase in acceptance/adaptation (Paige, Cohen, & Shively, 2004; Anderson, Lawton, Rexeisen, & Hubbard, 2006). Higher intercultural sensitivity scores are also associated with foreign language proficiency. University faculty and staff who reported high foreign language proficiency also scored higher on the IDI (Olson & Kroeger).

### *Cultural Intelligence Scale*

Cultural Intelligence (CQ) is a multi-dimensional, specific intelligence that predicts an individual's capacity to perform effectively in cross-cultural situations. Based on Sternberg's conceptualization of individual-level intelligence, Cultural Intelligence is composed of four dimensions. The subscales of the CQ Scale (CQS) assess the four dimensions: metacognitive CQ, cognitive CQ, motivational CQ, and behavioral CQ (Earley & Ang, 2003).

Though the CQS is still a relatively new measure of cultural competence, many validation studies have been conducted. As a self-report tool, the CQS correlates with performance in international contexts, cross-cultural adjustment, and international experience (Ang et al., 2007; Shannon & Begley, 2008; Tarique & Takeuchi, 2008; Templer, Tay, & Chandrasekar, 2006; Ward, Fischer, Lam, & Hall, 2009). The CQS also correlates with more global personality traits. More specifically, all four facets of the CQS were found to correlate with openness to experience (Ang, Van Dyne, & Koh, 2006). Positive relationships were also found between conscientiousness and metacognitive CQ, agreeableness and behavioral CQ, as well as extraversion with cognitive, motivational, and behavioral CQ (Ang et al., 2006).

Findings on the predictive validity of the CQS beyond that of emotional intelligence have been mixed. Using a sample of students, Ang et al. (2007) found CQ to have incremental validity over emotional intelligence in predictions of cultural judgment and decision making and cultural adaptation. Contrary to these findings, Ward et al. (2009) found that CQ failed to show incremental validity beyond emotional intelligence in predicting psychological, socio-cultural, and academic adaptation of international students. These findings also emerged when using the

MPQ in place of emotional intelligence; the CQS did not contribute additional predictive power over the MPQ.

The constructs measured in each of these three instruments overlap to some extent with skills and attributes identified as important for military personnel (Abbe et al., 2007; Vanderpool, 2002; Yellen & Mumford, 1975). For example, openness has emerged as an important characteristic in any intercultural context, both for military operations among foreign populations and for other expatriate settings. As a result, analyses were planned to determine whether the structure of each measure was similar to that found in non-military samples. As in non-military samples, we expected to find small correlations of these measures with biographical variables related to intercultural experience, including having lived abroad, interaction with members of other cultures, and knowledge of a foreign language.

In addition, we expected that the measures would correlate positively with each other. On the IDI, because ethnorelative stages are proposed to be more developmentally advanced than the ethnocentric stages, we expected that defense/denial and minimization would correlate negatively with the MPQ and CQS, while acceptance/adaptation would correlate positively. Furthermore, because both the IDI and the CQS purport to assess more dynamic intercultural characteristics, we expected those two measures would be strongly related. In particular, as a measure of cognitive orientation toward cultural difference, the IDI should relate to cognitive CQ. We further hypothesized that all three measures would correlate positively with confidence in one's ability to communicate and interact in a foreign culture.

## **Method**

### **Participants**

The present findings were based on two samples. The first sample was comprised of 131 Cadets from the United States Military Academy (USMA). The age of participants did not vary greatly; 81.7% of the Cadets indicated they were between the ages of 20 and 24. Seventy-five percent of the Cadets were male, 25% were female. Seventy-four percent of the participants indicated their race as 'white', 10.9% 'Asian,' and 3.9% 'Black or African American'.

The second sample was 169 active-duty Soldiers at several different installations. Though participants represented a variety of branches/MOS, the largest proportions of the sample were intelligence and infantry personnel. The age of participants varied across the sample between 20 and 49 years; 45% of the Soldiers indicated they were between 25 and 29 years, 25.4% between 30 and 34 years, and 19% between 35 and 39%. Eighty-six percent of the Soldiers were male, 14% were female. Seventy-eight percent of the Soldiers were white, 8% were Asian, and 6.6% were Black or African American. Participants also varied by rank: 40% were non-commissioned officers (23.8% Staff Sergeant, 15.5% Sergeant First Class, 1.2% Master Sergeant or Sergeant Major), and 60% were officers (7.1% Second Lieutenant, 44% Captain, 4.2% Major, 4.2% Lieutenant Colonel). The questionnaire administered to active-duty participants differed in some data collections, and thus the sample size differs for some included measures.

## Measures and Procedures

All participants completed a packet of paper-and-pencil measures. The measures included biographical questions, including demographic items and items about prior intercultural experiences, international travel<sup>2</sup>, and language. Participants then completed several measures of cross-cultural competence, which took about 45 minutes to complete.

**Biographical Variables.** Biographical items included age, education, number and length of deployments (for active-duty participants), and time having lived outside the United States. Intercultural interaction during deployment (for active-duty sample) and during times other than deployment (for both samples) was assessed on a five-point scale including: *Little or no interaction*; *Infrequent interaction*; *Occasional interaction*; *Regular Interactions*; and *A great deal; routine and daily interaction*. Language proficiency was assessed by self-report on a five-point scale with response options including: *Novice (know a few words and/or phrases)*; *Elementary (can ask some questions and make statements; understand gist of others' speech)*; *Working (can hold conversations on particular topics)*; *Professional (can hold conversations on a variety of social and professional topics)*; and *Native Speaker (can speak and understand the language as a native)*.

**Intercultural Efficacy.** Three items asked participants to rate their own ability to interact across cultures: (1) *In general, how effective are you in communicating with individuals from other cultures?*; (2) *In general, how effective are you at influencing individuals from other cultures?*; and (3) *In general, how prepared do you feel to interact with individuals from other cultures in the future?* Each item used a four point response scale including: *Not at all effective (prepared)*; *Somewhat effective (prepared)*; *Effective (prepared)*; and *Very effective (prepared)*. A composite was formed using these three questions ( $\alpha = .86$ ).

**Cultural Intelligence Scale (CQS).** Participants completed the 20-item CQS developed by Ang, Van Dyne, Koh, and Ng (2004). The measure includes four items for metacognitive CQ, six items for cognitive CQ, five items for motivational CQ, and five items for behavioral CQ. Examples include: "I am conscious of the cultural knowledge I use when interacting with people with different cultural backgrounds" for metacognitive CQ; "I know the legal and economic systems of other cultures" for cognitive CQ; "I enjoy interacting with people from different cultures" for motivational CQ; and "I change my non-verbal behavior when a cross-cultural situation requires it" for behavioral CQ. Participants responded on a seven-point scale, ranging from *strongly disagree* (1) to *strongly agree* (7).

**Multicultural Personality Questionnaire (MPQ).** The MPQ (van der Zee & van Oudenhoven, 2000; 2001) included 91 items measuring five factors: cultural empathy (18 items), openmindedness (18 items), social initiative (17 items), emotional stability (20 items), and flexibility (18 items). Examples of items include: "Understands other people's feelings" for cultural empathy; "Is interested in other cultures" for openmindedness; "Makes contacts easily"

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<sup>2</sup> Results using the international travel questions are not reported here but will be included in a subsequent report.

for social initiative; “Is not easily hurt” for emotional stability; and “Changes easily from one activity to another” for flexibility. Participants responded on a five-point scale, ranging from *totally not applicable* (1) to *completely applicable* (5).

**Intercultural Development Inventory (IDI).** The IDI included 50 items based on Bennett’s (1986) DMIS (Hammer et al., 2003). Five subscales are used to represent the six stage model: defense/denial (e.g. “It is appropriate that people do not care what happens outside their country” for denial, “It is appropriate that members of our stronger culture have more opportunities” for defense), reversal (opposite form of defense; e.g. “People from other cultures are more interested than we are in proving themselves”), minimization (e.g. “People are the same; we have the same needs, interests, and goals in life”), acceptance/adaptation (e.g. “I have observed many instances of misunderstanding due to cultural differences in gesturing or eye contact” for acceptance, “I can look at the world through the eyes of a person from another culture” for adaptation), and encapsulated marginality, which relates to one’s cultural identity (e.g. “I feel rootless because I do not think I have a cultural identification”). Responses were made on a five-point scale, ranging from *strongly disagree* (1) to *strongly agree* (5). Responses for the marginality scale are not reported here.

## Results

First, we present analyses examining the structure of each measure: the CQS, the MPQ, the IDI, and the intercultural efficacy scale. Factor analyses use the entire sample, including both Cadets and active-duty Soldiers. Next, we report analyses to compare the measures separately for our Cadet and active-duty samples. These results include correlations between each measure and variables of interest, as well as predictive utility analyses using intercultural efficacy as a proxy criterion variable. Finally, we report comparisons of Cadets, Officers, and NCOs.

### Factor Structure of Each Measure

Prior to assessing the utility of existing cross cultural competence measures, it is important to determine whether the structure of each measure reflects the structure obtained in previous empirical validation. To evaluate the structures of the intercultural efficacy measure, CQS, MPQ, and IDI when using a military sample, factor analyses were conducted on all items from each respective measure. As mentioned previously, the questionnaire administered to active-duty participants differed in some data collections, and thus the sample size differs for some included measures. Therefore, the factor analyses were conducted on data from 280 participants for the intercultural efficacy measure, 307 participants for the CQ, 311 participants for the MPQ, and 219 participants for the IDI.

**Cultural Intelligence Scale (CQS) Structure.** In previous research, the Cultural Intelligence Scale (CQS) had strongest empirical support as a four-factor structure (e.g. Van Dyne, Ang, & Koh, 2009) with the following subscales: metacognitive CQ, cognitive CQ, motivational CQ, and behavioral CQ. Van Dyne, Ang, and Koh (2009) reported a non-orthogonal four-factor model as holding structural superiority to alternatives, followed by a four-factor model with orthogonal rotation as the second best, and a three-factor model collapsing metacognitive CQ and cognitive CQ into a single factor as third best. We conducted factor analyses to evaluate the validity of the measure in a military sample and found slight discrepancies with Van Dyne, Ang, and Koh's (2009) findings.

Factor analyses of the present data confirmed that the strongest structure of the model includes four factors; however, an unrotated model (see Appendix A) using Eigenvalues great than 1 as the cutoff provided results inconsistent with the subscales suggested. With such an unrotated model, all items load highly on the first factor suggesting each item is related to all other items in the measure. The unrotated model accounted for 64.4% of the cumulative variance.

Results from an exploratory factor analysis with varimax rotation showed four factors with Eigenvalues greater than 1 (see Appendix B), and results from a factor analysis with varimax rotation requesting four factors mirrored those of the analysis with the Eigenvalue cutoff (see Table 1). This four-factor model more closely resembled the proposed subscales of the model posed in the literature. Furthermore, the four-factor model derived from these data accounted for 64.4% of the cumulative variance. All items from the behavioral CQ and motivational CQ subscales loaded highly on their respective factors with a few slight discrepancies. Cognitive CQ and metacognitive CQS subscales cross-loaded with various factors

suggesting relatively poor factor structure. All cognitive CQS items loaded highly on a factor free of other subscale items; however, four of the six cognitive CQS subscale items also loaded moderately to highly on other factors.

Table 1

*Factor Loadings for Principal Factors Extraction of the CQS with Varimax Rotation with Four Factors Forced*

	Behavioral CQ	Motivational CQ	Cognitive CQ	Metacognitive CQ
CQbeh2	.76			
CQbeh3	.60			
CQbeh4	.58			
CQmc3	.58	.36		
CQbeh1	.57			
CQbeh5	.54			
CQmc4	.48	.41		.33
CQmot1		.78		
CQmot2		.70		
CQmot4		.70		
CQmot3		.54		.34
CQmot5		.51		
CQcog3			.74	.32
CQcog1			.70	
CQcog4			.68	
CQcog6	.33		.61	
CQcog5		.35	.49	
CQmc1	.37			.66
CQcog2			.39	.53
CQmc2	.47	.40		.49

Note. Only variable loadings  $\geq .30$  have been included.

Although the four-factor structure produced results similar to the empirically supported four-factor structure in the literature, the metacognitive CQ scale did not load as expected, loading with other subscales and across numerous subscales. Given this relatively unstable four-factor structure, alternative models were tested with exploratory factor analysis. Van Dyne, Ang, and Koh (2009) suggested that a three-factor structure, on which the metacognitive CQ and cognitive CQ subscales collapsed to form one factor, was the next best model after the four-factor structure. Therefore, as the weakness of the four-factor model was due to the metacognitive CQ subscale and per the recommendation of Van Dyne, Ang, and Koh (2009), a factor analysis with varimax rotation requesting three factors to be produced was conducted (see Appendix C). The three factor model accounted for 59% of the cumulative variance. Though accounting for less variance than the four-factor structure, the three-factor structure provided

slightly more consistent factor loadings, including all metacognitive CQ items loading most highly on one factor. All behavioral CQ, cognitive CQ, and motivational CQ items loaded highly on separate factors with all respective subscale items. However, all four metacognitive CQ items loaded most highly on the same factor as the behavioral CQ subscale. Although the three-factor structure provided more clean factor loadings, the loading of the metacognitive CQ and behavioral CQ subscales on the same factor is inconsistent with empirical findings from the literature. The four-factor structure model was not as clean as one would hope, compared to the three-factor structure it provides more theoretically supported loadings.

The four factor model is preferred to the three factor model based on these data as its structure more closely resembles the proposed structure in the literature. Results from confirmatory factor analyses comparing the four factor model and the alternative three factor model further supported the relative strength of the four factor model. The four-factor model fit the data better with  $\chi^2 (146) = 505.371$  ( $p < .001$ ), root mean square error of approximation (RMSEA) = .09, goodness of fit index (GFI) = .852, normed fit index (NFI) = .948, and comparative fit index (CFI) = .963, compared to the three factor model:  $\chi^2 (149) = 719.647$  ( $p < .001$ ), RMSEA = .112, GFI = .802, NFI = .929, and CFI = .944. Although the four-factor model is the preferred model of the two, it did not demonstrate fit to the data as strong as Van Dyne et al. (2009).

**Multicultural Personality Questionnaire (MPQ) Structure.** The Multicultural Personality Questionnaire (MPQ) generally yields a five-factor structure in the literature representing subscales of cultural empathy, openmindedness, social initiative, emotional stability, and flexibility (van der Zee & Van Oudenhoven, 2001). An initial exploratory factor analysis of the MPQ produced 23 non-interpretable factors with Eigenvalues greater than 1. Such a lack of structure is not surprising given a sample size of 300 and a measure with 91 items. Therefore, per recommendation from the literature (van der Zee & Van Oudenhoven, 2001), a factor analysis with varimax rotation requesting five factors was conducted (see Appendix D). The five factors accounted for 37% of the cumulative variance, and communalities range from .17 to .65.

The resulting factor structure did not entirely support the proposed five subscales, as none of the subscales loaded entirely on an individual factor. Social initiative, flexibility, and emotional stability items loaded most cleanly on individual factors; however, all three subscales have items that cross-loaded or loaded entirely on other factors as well. Cultural empathy items tended to load together on the first factor; however, numerous openmindedness items loaded highly on this factor as well. Openmindedness items loaded most strongly together on the first factor with cultural empathy items, and openmindedness items also loaded together strongly on the second factor. The second factor, however, also includes items from numerous other subscales.

As mentioned previously, the sample size likely contributed to difficulty producing a clean factor structure for the 91-item MPQ. When forced into five factors, the subscales proposed in the literature vaguely were represented, though not cleanly. A confirmatory factor analysis provided further mixed evidence of the model's fit to the data with  $\chi^2 (3,994 df) = 10,386.56$  ( $p < .001$ ), RMSEA = .07, GFI = .58, NNFI = .91, and CFI = .91. Such findings



deviate from published empirical support for the factor structure proposed in the literature. For example, in a study utilizing college students, Leone, van der Zee, van Oudenhoven, Perugini, and Ercolani (2005) used confirmatory factor analysis to find support of the model's fit to their data with  $\chi^2 = 528.44$ ,  $p < .001$ , RMSEA = .074, NNFI = .93, and CFI = .91.

Though the fit of the data published here diverges from previously published models, it is difficult to make any conclusive interpretations. Current sample size ( $N=310$ ) was approximately 100 participants fewer than Leone et al. (2005). Indices that indicate weak fit may represent an artifact of a poor sample size-number of items ratio. For example,  $\chi^2$  largely is dependent on sample size. However, the indices GFI, NNFI, and CFI all are relatively uninfluenced by sample size, and here NNFI and CFI all surpass the recommended satisfactory benchmark of .90 (Bentler, 1990). Also, the RMSEA index of fit is below the recommended liberal benchmark of .08 (Browne, 1990). Therefore these inconsistencies suggest caution in drawing conclusions based on these data.

**Intercultural Development Inventory (IDI) Structure.** The Intercultural Development Inventory (IDI) is a developmental measure comprised of four empirically supported subscales across which an individual must advance in order, including defense/denial, reversal, minimization, and acceptance/adaptation, respectively (Bennett, 1986). As it is a developmental inventory, each subscale represents a conceptually different phase of intercultural sensitivity. Furthermore, interpretation of the measure can be approached in a couple of different ways. First, attention can be given to scores on relevant subscales as an individual progresses through the stages of intercultural sensitivity. Second, an individual's intercultural sensitivity can be viewed as being at one end of the spectrum (e.g., being in a state of ethnocentrism or ethnorelativism) or as being in a transitional, or shifting, phase of development. Presentation of results includes a brief explanation for the various conceptualizations.

Results of an initial exploratory factor analysis using varimax rotation (see Appendix E) found twelve factors with Eigenvalues greater than 1, accounting for 61.7% of the cumulative variance. Though the factors slightly resembled the proposed structure, results were partially non-interpretable because numerous items across all factors cross-loaded, and because items from different theoretical stages loaded together on the same factors. Therefore, a factor analysis using varimax rotation requesting four factors (see Appendix F) was conducted as suggested by the literature. The four factors accounted for only 38.1% of the cumulative variance; however, with the exception of three of the total fifty items, the subscales loaded cleanly onto individual, separate factors that mirrored the model posed in the literature.

Another factor analysis was conducted to test a second conceptualization of the IDI. Specifically, the IDI's developmental path can be viewed as containing ethnocentric and ethnorelative world views (Hammer et al., 2003) where the defense/denial and reversal subscales represent an ethnocentric world view, and the acceptance/adaptation subscale represents an ethnorelative world view. In this conceptualization, the minimization subscale would represent a third world view, a shifting world view. In other words, three theoretical phases of development exist: an ethnocentric world view, a shifting world view, and an ethnorelative world view. Therefore, a factor analysis using varimax rotation requesting three factors (see Appendix G) was conducted to test this notion. The three-factor model accounted for 32.73% of the

cumulative variance. Supporting this conceptualization, the defense, denial, and reversal subscales loaded on one factor; minimization loaded on a separate factor; and the acceptance and adaptation subscales loaded onto one separate factor as well.

Confirmatory factor analyses also were conducted to investigate further the fit of the model to the data. Though each model fit the data poorly, the four-factor model better fit the data than the three-factor model. The four-factor model had a  $\chi^2$  (939 *df*) = 1736.85 ( $p < .001$ ), RMSEA = .0624, GFI = .738, NFI = .735, and CFI = .851, whereas the three-factor model had a  $\chi^2$  (942 *df*) = 2370.65 ( $p < .001$ ), RMSEA = .0834, GFI = .674, NFI = .690, and CFI = .799

The exploratory factor analyses supported both conceptualizations of the IDI's developmental phases. However, the four-factor model accounted for a larger portion of the cumulative variance, and the four-factor model provides a framework from which more meaningful findings might arise, as it separates each developmental phase. Furthermore, though neither model fit the data well, the four-factor model was a better fit as indicated by the confirmatory factor analyses. For these reasons, when using the IDI, a four-factor model is recommended.

### **Intercultural Efficacy Factor**

Ideally, behavioral performance ratings in intercultural settings would be used to assess predictive validity of cross-cultural competence instruments. However, we were unable to obtain performance outcomes in the present research. Therefore in lieu of behavioral ratings, a composite of three self-report items capturing self-efficacy in intercultural interactions was used as a criterion variable in analyses.

Results from a principal components analysis (see Table 2) suggested one main component that accounts for 78.6% of the variance. Further investigation of the suggested one-factor structure was performed through factor analysis (see Table 3). Results of the factor analysis supported the structure as only one factor had an Eigenvalue surpassing 1. With an Eigenvalue of 2.36, the factor accounted for 78.6% of the cumulative variance and all three items loaded highly on it. The reliability of the intercultural efficacy measure ( $\alpha = .86$ ) along with the loading of items on one factor support its use as a composite variable.

Table 2  
*Principal Components for Intercultural Efficacy*

	Intercultural Efficacy
Effective at influencing	.90
Effective at communicating	.89
Prepared to interact	.88

Table 3

*Factor Loadings for Factor Analysis With Varimax  
Rotation of Intercultural Efficacy*

	Intercultural Efficacy
Effective at influencing	.85
Effective at communicating	.82
Prepared to interact	.80

### Cadets

Table 4 reports the descriptive statistics and reliabilities of the three measures computed for the sample of USMA cadets. All scales and subscales had adequate reliability. The scale means for the CQS subscales and the MPQ subscales of cultural empathy and openmindedness all exceeded the mid-point of the scales.

Table 4

*Descriptive Statistics for Cadets*

Measures	M	SD	$\alpha$
Cultural Intelligence			
Metacognitive CQ	5.52	.79	.79
Cognitive CQ	4.66	.87	.79
Motivational CQ	5.91	.76	.83
Behavioral CQ	5.22	.89	.79
Total CQ	5.28	.70	.92
Multicultural Personality Questionnaire			
Cultural Empathy	3.93	.50	.90
Openmindedness	3.92	.47	.87
Social Initiative	3.76	.46	.86
Emotional Stability	3.50	.43	.81
Flexibility	3.44	.43	.80
Total MPQ	3.70	.34	.93
Intercultural Development Inventory			
Defense/Denial	2.05	.59	.82
Reversal	2.54	.68	.78
Minimization	3.42	.64	.74
Acceptance/Adaptation	3.59	.63	.86

**Correlations.** Although the structure of the CQS and MPQ in our analyses did not clearly match that found in previous research, we did not find a clear alternative structure and therefore report the remaining analyses using the subscales identified in previous research. Table 5 presents correlations among the various subscales across measures. Table 6 presents

correlations of each subscale with our intercultural efficacy measure, and Table 7 presents correlations of the measures and subscales with biographical variables that have been shown to correlate with these measures in previous research.

Table 5 presents the correlations among the three scales. As expected, respondents who reported higher levels of CQ were also higher in intercultural development. The CQS showed a negative relationship with IDI defense/denial and a strong positive relationship with IDI acceptance/adaptation. Higher CQ was also associated with higher levels on the MPQ,  $r = .63$ ,  $p < .01$ , demonstrating convergent validity.

Correlations among the subscales of the different measures were also in the expected direction. All CQS subscales have significantly correlate with MPQ subscales cultural empathy, openmindedness, social initiative, and flexibility, ranging from .25 to .60. For the most part, lower defense/denial and higher acceptance/adaptation on the IDI were associated with higher scores on the CQS subscales. Respondents who reported higher behavioral CQ also tended to report slightly higher levels of minimization on the IDI,  $r = .23$ ,  $p < .01$ . Acceptance/adaptation on the IDI showed a strong relationship with the MPQ subscales cultural empathy, openmindedness, and social initiative, ranging from  $r$ 's = .53 and .61, respectively, and a smaller but significant relationship with flexibility,  $r = .32$ . Only the acceptance/adaptation subscale of the IDI correlated with cognitive CQ.

**CQS.** The intercorrelations among the CQS subscales were positive in direction and moderate to strong in size, ranging from .44 to .76 (Table 5). Table 6 shows the correlations between the CQS subscales and intercultural efficacy. Cadets who reported higher levels of intercultural efficacy also tended to show higher levels of CQ, with  $r$ 's ranging from .44 for behavioral CQ to .52 for cognitive CQ,  $p$ 's  $< .01$ .

Cadets were also asked about various biographical variables (Table 7). Cadets who scored higher on cognitive CQ ( $r = .20$ ) and motivational CQ ( $r = .18$ ) tended to report longer periods of living outside the United States, though these relationships were small. All subscales of the CQS were related to the amount of intercultural interaction, with correlations ranging from .27 to .31,  $p$ 's  $< .01$ . As would be expected, of all the subscales, cognitive CQ correlated the highest with language proficiency,  $r = .38$ ,  $p < .01$ .

Table 5  
*Intercorrelations of the Measures in Cadets*

CCC Measures	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Cultural Intelligence Scale														
1. Metacognitive CQ	.59**	.76**	.73**	.88**	.60**	.56**	.47**	.14	.32**	.57**	-.37**	.07	.16	.56**
2. Cognitive CQ		.44**	.60**	.81**	.41**	.48**	.42**	.26**	.26**	.49**	-.17	.10	.02	.51**
3. Motivational CQ			.66**	.81**	.51**	.59**	.51**	.26**	.40**	.61**	-.32**	.10	.07	.53**
4. Behavioral CQ				.88**	.50**	.48**	.41**	.13	.25**	.48**	-.25**	.17	.23**	.64**
5. Total CQ					.58**	.62**	.53**	.24**	.35**	.63**	-.31**	.13	.13	.66**
Multicultural Personality Questionnaire														
6. Cultural Empathy						.72**	.56**	.19*	.40**	.79**	-.33**	.12	.26**	.53**
7. Openmindedness							.60**	.24**	.42**	.81**	-.33**	.12	.14	.61**
8. Social Initiative								.45**	.37**	.80**	-.18*	.01	.11	.56**
9. Emotional Stability									.47**	.63**	.07	.03	-.11	.10
10. Flexibility										.70**	-.15	.03	-.07	.32**
11. Total MPQ											-.25**	.08	.10	.57**
Intercultural Development Inventory														
12. Defense/Denial												.15	-.24**	-.33**
13. Reversal													-.03	.11
14. Minimization														.14
15. Acceptance/Adaptation														

Note.  $N = 130$ .

\* $p < .05$ . \*\* $p < .01$ .

Table 6

*Correlations with Intercultural Efficacy in Cadets*

Measures	Intercultural Efficacy
Cultural Intelligence Scale	
Metacognitive CQ	.46**
Cognitive CQ	.52**
Motivational CQ	.51**
Behavioral CQ	.44**
Multicultural Personality Questionnaire	
Cultural Empathy	.41**
Openmindedness	.47**
Social Initiative	.48**
Emotional Stability	.24**
Flexibility	.29**
Intercultural Development Inventory	
Defense/Denial	-.16
Reversal	-.04
Minimization	-.09
Acceptance/Adaptation	.50**

Note.  $N = 129$ .

\*\* $p < .01$ .

**MPQ.** Intercorrelations among the MPQ subscales are reported in Table 5. All subscales significantly correlated with each other, ranging from .19 to .72. Cultural empathy, openmindedness, and social initiative strongly related with each other, with statistically significant correlations ranging from .56 to .72. Flexibility correlated moderately with other subscales ranging from .37 to .47. Emotional stability correlated least strongly with the other subscales ranging from .19 to .45. Table 6 presents the correlations between the MPQ subscales and intercultural efficacy. All MPQ subscales significantly, positively correlate with intercultural efficacy ranging .24 to .47.

In correlations with biographical variables (Table 7), openmindedness was the only subscale to have a statistically significant correlation with amount of time lived outside the United States,  $r = .18$ . Cultural empathy, openmindedness, social initiative, and flexibility all were associated with higher levels of interaction with members of other cultures ( $r$ 's = .28, .36, .28, and .20, respectively) and cultural empathy, openmindedness, and social initiative all significantly correlated with with foreign language proficiency ( $r$ 's = .30, .35, and .35, respectively,  $p$ 's < .01).

**IDI.** The intercorrelations presented in Table 5 for the IDI stages show that higher levels of defense/denial were associated with lower levels of minimization,  $r = -.24$ , and acceptance/adaptation,  $r = -.33$ . Only the final stage of intercultural development, acceptance/adaptation, was significantly correlated with intercultural efficacy,  $r = .50$ , as seen in Table 6. The same trend emerged for intercultural interaction experience (see Table 7); higher

levels of acceptance/adaptation were associated with higher levels of intercultural interaction,  $r = .39$ ,  $p < .01$ . Defense/denial, minimization, and acceptance/adaptation showed small correlations with amount of time lived outside the United States, ranging from  $-.17$  to  $.22$ ,  $p$ 's  $< .05$ . Defense/denial and acceptance/adaptation were significantly correlated with language proficiency in the expected direction,  $r$ 's  $= -.30$  and  $.33$ , respectively,  $p$ 's  $< .01$ .

Table 7  
*Correlations with Biographical Variables in Cadets*

CCC Measures	Time Lived Outside US	Intercultural Interaction	Language Proficiency
Cultural Intelligence Scale			
Metacognitive CQ	.13	.31**	.31**
Cognitive CQ	.20*	.31**	.38**
Motivational CQ	.18*	.27**	.31**
Behavioral CQ	.12	.28**	.27**
Total CQ	.19*	.35**	.38**
Multicultural Personality Questionnaire			
Cultural Empathy	.08	.28**	.30**
Openmindedness	.18*	.36**	.35**
Social Initiative	.14	.28*	.35**
Emotional Stability	.10	.02	.11
Flexibility	.12	.20*	.09
Total MPQ	.17	.30**	.32**
Intercultural Development Inventory			
Defense/Denial	-.17*	-.04	-.30**
Reversal	.03	.05	.00
Minimization	-.20*	-.09	-.15
Acceptance/Adaptation	.22*	.39**	.33**

Note.  $N = 129$ .

\* $p < .05$ . \*\* $p < .01$ .

**Relative contributions of subscales.** This section discusses the ability of each measure to predict intercultural efficacy, as well relative contributions of the subscales within each measure. Separate simultaneous regressions were computed for intercultural efficacy on each of the three other measures (see Table 8). MPQ accounted for 29% of the variance in intercultural efficacy with openmindedness and social initiative producing significant beta weights. The IDI accounted for 28% of the variance in intercultural efficacy. Acceptance/adaptation carried the most weight of the four stages,  $\beta = .53$ ,  $p < .01$ , though minimization also had a significant beta weight,  $\beta = -.17$ ,  $p < .05$ . The CQS was found to explain 25% of the variance in intercultural efficacy. Cognitive and motivational CQ produced significant beta weights,  $\beta$ 's  $= .39$  and  $.40$ , respectively.

Table 8

*Simultaneous Regressions Predicting Cadet Intercultural Efficacy from the MPQ, IDI, and CQS*

CCC Measures	Intercultural Efficacy	
	<i>r</i>	$\beta$
<b>Cultural Intelligence Scale</b>		
Metacognitive CQ	.46**	-.06
Cognitive CQ	.52**	.39**
Motivational CQ	.51**	.40**
Behavioral CQ	.44**	-.02
<i>R</i>		.61
<i>R</i> <sup>2</sup>		.35
<b>Multicultural Personality Questionnaire</b>		
Cultural Empathy	.41**	.06
Openmindedness	.47**	.24*
Social Initiative	.48**	.27*
Emotional Stability	.24**	.03
Flexibility	.29**	.06
<i>R</i>		.54
<i>R</i> <sup>2</sup>		.29
<b>Intercultural Development Inventory</b>		
Defense/Denial	-.16*	-.01
Reversal	-.04	-.10
Minimization	-.09	-.17*
Acceptance/Adaptation	.50**	.53**
<i>R</i>		.53
<i>R</i> <sup>2</sup>		.28

Note. *N* = 129.

\**p* < .05. \*\**p* < .01.

**Comparisons between measures.** Table 9 presents hierarchical regression results assessing the relative utility of the MPQ, IDI AA<sup>3</sup>, and CQS for predicting cadet intercultural efficacy. Intercultural efficacy was regressed onto the measures in order of the constructs' theorized relative levels of stability, from least stable to most stable (i.e., MPQ, IDI AA, then CQS). Each measure predicted significant variance above and beyond the previous measures. The MPQ predicted 26% unique variance (*p* < .001) in intercultural efficacy, IDI AA predicted 6% unique variance (*p* < .001) above and beyond the MPQ, and the CQS predicted 5% unique variance (*p* < .001) above and beyond both the MPQ and IDI AA. Together, the three measures accounted for 38% of the variance (*p* < .001) in intercultural efficacy.

<sup>3</sup> We did not use composite scores for the IDI as some researchers have recommended (Paige, Jacobs-Cassuto, Yershova, & DeJaeghere, 2003). Only the IDI acceptance/adaptation subscale is included here because it is the only developmental level in the DMIS explicitly proposed to be related to intercultural behavior.



Table 9

*Hierarchical Multiple Regression Predicting Cadet Intercultural Efficacy From MPQ, IDI-AA, AND CQS*

Predictor	Intercultural Efficacy		
	Step 1 $\beta$	Step 2 $\beta$	Step 3 $\beta$
MPQ	.51***	.33***	.21*
IDI-AA		.31***	.15
CQS			.34***
Total $R^2$	.26	.32	.38
$\Delta R^2$		.06***	.05***
$df$	1, 127	1, 126	1, 125

Note. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p \leq .001$ .

**Active Duty**

**Correlations.** Table 10 reports the descriptive statistics and reliabilities of the three measures computed for the active-duty sample. The IDI was omitted from some data collections; thus, the sample size for the IDI is lower,  $N = 77$ . The scale means for metacognitive, motivational, and behavioral CQ exceeded the mid-point of the scale.

Table 10

*Descriptive Statistics for Active Duty Soldiers*

CCC Measures	M	SD	$\alpha$
Cultural Intelligence Scale			
Metacognitive CQ	5.44	.92	.85
Cognitive CQ	4.37	1.13	.86
Motivational CQ	5.44	1.05	.85
Behavioral CQ	5.23	1.02	.85
Total CQ	5.07	.87	.93
Multicultural Personality Questionnaire			
Cultural Empathy	3.79	.55	.69
Openmindedness	3.74	.54	.83
Social Initiative	3.79	.50	.88
Emotional Stability	3.54	.43	.81
Flexibility	3.26	.44	.80
Total MPQ	3.62	.37	.93
Intercultural Development Inventory			
Defense/Denial	2.30	.62	.79
Reversal	2.29	.74	.82
Minimization	3.21	.71	.78
Acceptance/Adaptation	3.46	.69	.86

Table 11 presents the correlations between the three scales. As in the cadet sample, higher CQ was associated with higher levels of intercultural development. CQS scores were strongly related to IDI acceptance/adaptation,  $r = .67, p < .001$ , as well as moderately related to the MPQ,  $r = .53, p < .01$ . Correlations among the subscales of the different measures were also in the expected direction. The CQS subscales showed positive correlations with all MPQ subscales ranging from .17 to .63. Generally, the CQS subscales showed moderate and statistically significant correlations with the defense/denial and acceptance/adaptation stages of the IDI.

The MPQ subscales correlated with some IDI stages. Cultural empathy and flexibility negatively correlated with IDI Defense/Denial ( $r = -.24$  and  $-.31$  respectively). All MPQ subscales positively correlated with IDI Acceptance/Adaptation.

**CQS.** The intercorrelations among the CQS subscales were in the expected direction as seen in Table 11. The subscale scores ranged from .49 to .78,  $p < .01$ . Table 12 presents the correlations between the CQS subscales and intercultural efficacy. All subscales were strongly correlated with intercultural efficacy. Soldiers also provided information about various biographical variables (Table 13). No significant correlations were found between the CQS subscales and total months deployed; however, all subscales had significant correlations with interaction with members of other cultures during deployment and amount of time lived outside the United States. The CQS subscales were also moderately correlated with intercultural interactions during times other than deployment, ranging from .41 to .54,  $p < .01$ . Additionally, all subscales were positively related to language proficiency, with motivational CQ showing the largest relationship,  $r = .42, p < .01$ .

**MPQ.** All MPQ subscales were significantly correlated with one another; however, the size of the correlations varied. Following a similar pattern as the Cadets, cultural empathy, openmindedness, and social initiative strongly correlated with each other, ranging from .49 to .66. Flexibility and emotional stability demonstrated weaker correlations with the other subscales, with moderate correlations ranging from .29 to .47 and .30 to .53 respectively.

All subscales were significantly correlated with intercultural efficacy, ranging from .22 to .40 (see Table 12). As with the CQS, no significant correlations were found between the MPQ subscales and total months deployed (see Table 13). Both cultural empathy and social initiative showed a significant correlation with interaction with foreign nationals during deployment ( $r = .21, p < .05$ , and  $r = .23, p < .01$ , respectively). None of the subscales were associated with amount of time lived outside of the United States. Cultural empathy, openmindedness, emotional stability, and flexibility all were significantly correlated with intercultural interactions in times other than during deployment, with correlations ranging from .20 to .49. Cultural empathy, openmindedness, flexibility ( $p < .01$ ), and emotional stability ( $p < .05$ ) all significantly correlated with foreign language proficiency ( $r$ 's = .27, .39, .27 and .16, respectively).

Table 11  
*Intercorrelations of the Measures in Active-Duty Soldiers*

CCC Measures	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Cultural Intelligence Scale <sup>a</sup>														
1. Metacognitive CQ	.60**	.67**	.78**	.88**	.37**	.41**	.24**	.21**	.25**	.40**	-.33**	-.25*	.13	.52**
2. Cognitive CQ		.49**	.54**	.82**	.26**	.46**	.24**	.20**	.21**	.37**	-.06	-.14	.03	.48**
3. Motivational CQ			.60**	.81**	.43**	.63**	.39**	.31**	.48**	.60**	-.29**	.01	.12	.58**
4. Behavioral CQ				.85**	.43**	.42**	.25**	.20**	.17*	.41**	-.15	-.09	.16	.70**
5. Total CQ					.43**	.58**	.34**	.27**	.33**	.53**	-.22	-.13	.12	.67**
Multicultural Personality Questionnaire <sup>a</sup>														
6. Cultural Empathy						.66**	.49**	.30**	.29**	.76**	-.24*	.03	.05	.53**
7. Openmindedness							.56**	.37**	.47**	.84**	-.15	.05	.10	.63**
8. Social Initiative								.53**	.43**	.80**	-.09	.00	.05	.40**
9. Emotional Stability									.38**	.68**	-.12	-.17	.11	.26*
10. Flexibility										.67**	-.31**	-.10	-.05	.33**
11. Total MPQ											-.22	-.04	.07	.55**
Intercultural Development Inventory <sup>b</sup>														
12. Defense/Denial												.37**	-.04	-.06
13. Reversal													.16	.14
14. Minimization														.11
15. Acceptance/Adaptation														

Note . <sup>a</sup> *N* = 168. <sup>b</sup> *N* = 77.

\**p* < .05. \*\**p* < .01.

Table 12

*Correlations with Intercultural Efficacy in Active-Duty Soldiers*

CCC Measures	Intercultural Efficacy
Cultural Intelligence Scale <sup>a</sup>	
Metacognitive CQ	.51**
Cognitive CQ	.43**
Motivational CQ	.53**
Behavioral CQ	.55**
Multicultural Personality Questionnaire <sup>a</sup>	
Cultural Empathy	.40**
Openmindedness	.36**
Social Initiative	.34**
Emotional Stability	.31**
Flexibility	.22**
Intercultural Development Inventory <sup>b</sup>	
Defense/Denial	-.20
Reversal	-.15
Minimization	.12
Acceptance/Adaptation	.43**

Note. <sup>a</sup>  $N = 168$ . <sup>b</sup>  $N = 77$

\*\* $p < .01$ .

**IDI.** The intercorrelations among the IDI stages are presented in Table 11. The only stages to have significant correlations were Defense/Denial and Reversal,  $r = .37$ ,  $p < .01$ . Only the final stage of intercultural development, Acceptance/Adaptation, was significantly correlated with intercultural efficacy,  $r = .43$  (Table 12<sup>4</sup>).

Correlations between the IDI stages and biographical variables are presented in Table 13. None of the stages was significantly correlated with total months deployed and only Acceptance/Adaptation showed a significant correlation with intercultural interaction during deployment,  $r = .32$ ,  $p < .05$ . Respondents who reported higher levels of Minimization were more likely to have lived outside of the United States, for greater lengths of time,  $r = .30$ ,  $p < .05$ . Higher levels of Defense/Denial were associated with lower levels of intercultural interaction in times other than deployment ( $r = -.37$ ,  $p < .01$ ) and lower levels of foreign language proficiency ( $r = -.28$ ,  $p < .05$ ). As would be expected, higher levels of Acceptance/Adaptation were associated with higher levels of intercultural interaction in times other than deployment and higher levels of foreign language proficiency ( $r$ 's = .48 and .34, respectively,  $p$ 's < .01).

<sup>4</sup> The intercultural efficacy items were added after the initial data collection. This combined with the IDI not being included in all the data collections results in a smaller sample size,  $N = 50$ .

Table 13

*Correlations with Biographical Variables in Active-Duty Soldiers*

CCC Measures	Total Months Deployed	Deployment Interaction	Time Lived Outside US	Non-Deployment Interaction	Language Proficiency
Cultural Intelligence Scale <sup>a</sup>					
Metacognitive CQ	.02	.36**	.17*	.41**	.30**
Cognitive CQ	.01	.23**	.28**	.49**	.35**
Motivational CQ	.00	.19*	.24**	.50**	.42**
Behavioral CQ	-.03	.31**	.22**	.41**	.32**
Total CQ	.00	.31**	.27**	.54**	.42**
Multicultural Personality Questionnaire <sup>a</sup>					
Cultural Empathy	.08	.21*	.06	.34**	.27**
Openmindedness	-.01	.13	.14	.49**	.39**
Social Initiative	-.05	.23**	-.01	.22**	.04
Emotional Stability	-.09	.01	.00	.20*	.16*
Flexibility	-.03	.01	.03	.32**	.27**
Total MPQ	-.02	.16	.06	.42**	.31**
Intercultural Development Inventory <sup>b</sup>					
Defense/Denial	.11	.06	.05	-.37**	-.28*
Reversal	.23	.16	.15	-.14	.06
Minimization	.10	.12	.30*	.14	-.01
Acceptance/Adaptation	.04	.32*	.11	.48**	.34**

Note. <sup>a</sup> N = 135-167. <sup>b</sup> N = 46-76.

\*  $p < .05$ . \*\*  $p < .01$ .

**Relative contributions of subscales.** This analysis explored the relative contributions of the subscales within each measure in explaining variance in intercultural efficacy. Separate simultaneous regressions were computed for intercultural efficacy on each of the three measures (see Table 14). MPQ accounted for 21% of the variance in intercultural efficacy, with cultural empathy producing the only significant beta weight,  $\beta = .26$ ,  $p < .05$ . The IDI accounted for 24% of the variance in intercultural efficacy. It should be noted that the sample size is smaller for the IDI,  $N = 76$ . Acceptance/adaptation carried the most weight of the four stages,  $\beta = .43$ ,  $p < .01$ , and it was the only IDI stage that significantly predicted intercultural efficacy. The CQS was found to explain 37% of the variance in intercultural efficacy. Motivational CQ and Behavioral CQ both produced significant beta weights,  $\beta = .29$ ,  $p < .01$  and  $\beta = .30$ ,  $p < .01$  respectively.

Table 14

*Simultaneous Regressions Predicting Active-Duty Intercultural Efficacy from the MPQ, IDI, and CQS*

	Intercultural Efficacy	
	<i>r</i>	$\beta$
Cultural Intelligence Scale <sup>a</sup>		
Metacognitive CQ	.64**	.01
Cognitive CQ	.51**	.13
Motivational CQ	.64**	.29**
Behavioral CQ	.63**	.30**
<i>R</i>		.61
<i>R</i> <sup>2</sup>		.37
Multicultural Personality Questionnaire <sup>a</sup>		
Cultural Empathy	.40**	.26*
Openmindedness	.36**	.08
Social Initiative	.34**	.08
Emotional Stability	.31**	.15
Flexibility	.22**	.02
<i>R</i>		.46
<i>R</i> <sup>2</sup>		.21
Intercultural Development Inventory <sup>b</sup>		
Defense/Denial	-.11	-.10
Reversal	-.14	-.18
Minimization	.16	.09
Acceptance/Adaptation	.63**	.43**
<i>R</i>		.49
<i>R</i> <sup>2</sup>		.24

Note. <sup>a</sup>  $N = 167$ . <sup>b</sup>  $N = 76$ .

\* $p < .05$ . \*\* $p < .01$ .

**Comparisons between measures.** Table 15 presents hierarchical regression results assessing the relative utility of the MPQ, IDI AA, and CQS for predicting active duty personnel intercultural efficacy. Intercultural efficacy was regressed onto the measures in order of measure stability, from least stable to most stable (i.e., MPQ, IDI AA, then CQS). Each measure predicted significant variance above and beyond the previous measures. The MPQ predicted 19% of the variance ( $p < .001$ ) in intercultural efficacy, the IDI AA predicted 5% unique variance ( $p < .05$ ) above and beyond the MPQ, and the CQS predicted 14% unique variance ( $p < .001$ ) above and beyond both the MPQ and IDI AA. Together, the three measures accounted for 38% of the variance ( $p < .001$ ) in intercultural efficacy.

Table 15

*Hierarchical Multiple Regression Predicting Active-Duty Intercultural Efficacy from MPQ, IDI-AA, and CQS*

Predictor	Intercultural Efficacy		
	Step 1 $\beta$	Step 2 $\beta$	Step 3 $\beta$
MPQ	.44***	.29*	.17
IDI-AA		.26*	-.01
CQ			.51***
Total $R^2$	.19	.24	.38
$\Delta R^2$		.05*	.14***
$df$	1, 75	1, 74	1, 73

Note. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

As the active-duty sample size for the IDI was small, intercultural efficacy also was regressed onto just the MPQ and CQS. Table 16 presents hierarchical regression results assessing the relative utility of the MPQ and CQS for predicting active duty personnel intercultural efficacy. Intercultural efficacy was regressed onto the measures in order of measure stability, from less stable to more stable (i.e., MPQ then CQS). Both measures accounted for unique variance. The MPQ predicted 19% of the variance ( $p < .001$ ) of intercultural efficacy, and the CQS predicted 19% unique variance ( $p < .001$ ) above and beyond the MPQ. Together the two measures accounted for 38% of the variance ( $p < .001$ ) of intercultural efficacy.

Table 16

*Hierarchical Multiple Regression Predicting Intercultural Efficacy in Active-Duty Sample*

Predictor	Intercultural Efficacy	
	Step 1	Step 2
	$\beta$	$\beta$
MPQ	.47***	.20**
CQ		.60***
Total $R^2$	.19	.38
$\Delta R^2$		.19***
$df$	1, 166	1, 165

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Comparing Cadets, Officers, and Non-Commissioned Officers**

We conducted independent-samples  $t$ -tests to determine whether cadets, officers, and NCOs differed in their levels of cross-cultural competence. As indicated in Table 17, mean scores from both cadets and NCOs were compared to officers' means. NCOs showed greater variability in their responses on the CQS than did officers or cadets, as well as on the Social Initiative and Emotional Stability subscales of the MPQ<sup>5</sup>.

Of the three groups, NCOs reported the lowest scores on the CQS, showing significant differences from both officers,  $t(167) = 2.18, p = .03$ , and cadets,  $t(197) = 3.19, p = .002$ . NCOs reported lower Metacognitive CQ, Cognitive CQ, and Motivational CQ than both officers and cadets. Cadets reported significantly higher levels of Motivational CQ than did officers and NCOs,  $t(230) = 2.56, p = .01$ , and  $t(197) = 5.31, p = .02$ , respectively.

Officers reported higher scores than did NCOs on MPQ Openmindedness and Flexibility ( $t$ 's (167) = 2.74 and 2.49,  $p \leq .01$ ) (See Table 17 for means). Cadets reported higher levels of Cultural Empathy, Openmindedness, and Flexibility than did NCOs,  $t$ 's (197) = 2.63, 4.48, and 4.39, respectively,  $p < .001$ .

Officers showed higher levels of intercultural development on the IDI than did cadets and NCOs. Officers scored lower on the ethnocentric stages of Defense/Denial and Reversal than NCOs,  $t(75) = 3.84, p < .001$ , and  $t(75) = 2.41, p = .02$ . In addition, officers scored lower on Reversal than cadets,  $t(152) = 3.61, p < .001$ . They showed higher levels of Acceptance/Adaptation than NCOs,  $t(75) = 2.37, p = .02$ .

<sup>5</sup> Levene's test for equality of variances showed significant differences between the variability of NCO's responses and that of Officers and Cadets for these scales; however, these differences did not impact the  $t$ -tests reported in this section; thus, for consistency, these results report all  $t$ -tests uncorrected for unequal variances.



In comparing levels of intercultural efficacy, cadets reported higher confidence than did NCOs,  $t(183) = 3.33, p = .001$ . Neither Cadets nor NCOs significantly differed from officers on intercultural efficacy.

Table 17

*Comparison of Cadet, Officer, and NCO Levels of Cross-Cultural Competence*

CCC Measures	Cadets	Officers	NCOs
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Cultural Intelligence Scale <sup>a</sup>			
Metacognitive CQ	5.52 (.79)	5.58 (.77)	5.22 (1.06)*
Cognitive CQ	4.66 (.87)	4.42 (1.08)	4.32 (1.21)
Motivational CQ	5.91 (.76)*	5.63 (.90)	5.17 (1.19)**
Behavioral CQ	5.22 (.89)	5.36 (.89)	5.05 (1.16)
Total CQ	5.28 (.70)	5.19 (.75)	4.89 (1.00)*
Multicultural Personality Questionnaire <sup>a</sup>			
Cultural Empathy	3.93 (.50)	3.84 (.59)	3.74 (.48)
Openmindedness	3.92 (.47)	3.83 (.55)	3.60 (.50)**
Social Initiative	3.76 (.46)	3.82 (.51)	3.74 (.49)
Emotional Stability	3.50 (.43)	3.55 (.41)	3.52 (.45)
Flexibility	3.44 (.43)*	3.33 (.43)	3.16 (.45)**
Total MPQ	3.70 (.34)	3.67 (.37)	3.55 (.35)*
Intercultural Development Inventory <sup>b</sup>			
Defense/Denial	2.05 (.59)	1.93 (.64)	2.47 (.54)**
Reversal	2.54 (.68)**	2.00 (.65)	2.42 (.75)*
Minimization	3.42 (.64)	3.17 (.69)	3.23 (.73)
Acceptance/Adaptation	3.59 (.63)	3.73 (.58)	3.34 (.70)*
Intercultural Efficacy	8.68 (1.85)	8.25 (2.23)	7.64 (2.17)*

\*\* Differs from Officer mean at  $p \leq .01$ ; \* differs from Officer mean at  $p < .05$

## Discussion

The present research examined the structure of and relations among three different measures of cross-cultural competence and related constructs in an Army sample, the Cultural Intelligence Scale (CQS), the Multicultural Personality Scale (MPQ), and the Intercultural Development Inventory (IDI). Overall, we found evidence of convergent validity among all three measures and mixed evidence of construct validity. Overall, scale reliabilities reached acceptable levels and were as high as those found in previous research. Factor analyses were generally consistent with previous research showing a four-factor structure as the best fit for the CQS and for the IDI, though the fit to each measure's proposed structure was not particularly good. Factor analyses for the MPQ produced inconsistent indicators of model fit, likely due to the relatively small ratio of participants in the sample to items.

Correlations among the measures showed positive associations, with correlations indicating substantial overlap among the MPQ, CQS, IDI, and our intercultural efficacy items. Examinations of the subscales showed that MPQ flexibility and emotional stability and IDI reversal and minimization were exceptions. MPQ flexibility and emotional stability showed smaller and fewer correlations with other variables, which is not surprising as these are the only two constructs among the set that are not explicitly social or interpersonal in nature. Whereas the CQS, IDI, and other MPQ subscales all measure aspects of one's patterns and preferences regarding social interactions and situations, and items for flexibility and emotional stability refer to the respondent's patterns more broadly, including, but not limited to the social or cultural domain.

We also examined correlations with biographical variables that have previously been linked with cross-cultural competence, including living abroad, knowing a foreign language, and levels of intercultural interaction. Consistent relationships emerged for intercultural interaction and self-reported language proficiency; these variables correlated positively with all CQS subscales, MPQ openmindedness and empathy, and IDI acceptance/adaptation. Results for time lived abroad were mixed, as were results for other MPQ and IDI subscales.

Differences among officers, NCOs, and cadets indicated that officers in our sample tended to report higher levels of cross-cultural competence than NCOs. Officers reported the highest levels of intercultural traits on the MPQ and showed more ethnorelative, less ethnocentric views on the IDI. NCOs in our sample reported the lowest levels of CQ and intercultural efficacy. Few conclusions can be drawn from these findings alone, however, as the officers, NCOs, and cadets in our sample were not selected to be representative of their respective populations.

Conceptually, cultural intelligence and intercultural efficacy are the least stable and most dynamic of the four constructs examined in this research. As a result, responses on the CQS and intercultural efficacy scale could be heavily influenced by recent experiences. A high level of intercultural efficacy may mean that an individual is very capable of successful intercultural interactions, but it may also reflect that the respondent has experienced recent positive interactions that boosted their confidence, or that the respondent has experienced intercultural situations that were not particularly challenging. It is unclear from the present data whether

participants' levels of efficacy were realistic indicators of their ability or whether they may reflect overconfidence.

In testing the ability of the three measures to predict variability in intercultural efficacy, each of the three instruments made unique contributions. This finding suggests that despite the convergence among measures, each is measuring something slightly different, which is consistent with the notion that both personality and more dynamic characteristics contribute to intercultural adaptation and adjustment. However, hierarchical regressions showed that the contributions of the MPQ and IDI-AA were reduced when the CQS was included. Given the higher degree of similarity in content and wording of the intercultural efficacy items and the CQS items than of items on the other scales, this finding is not surprising. Both of these scales ask explicitly about the respondents' confidence about or awareness in intercultural interactions.

The present findings suggest that the existing instruments are strongly weighted toward affective and motivational components of cross-cultural competence, and the three instruments seem to have the greatest overlap in this dimension. Both samples showed a pattern of correlations involving motivational, behavioral, and metacognitive CQ; MPQ empathy and openmindedness; and IDI Acceptance/Adaptation. The extent to which cognitive or behavioral components are really represented is less clear. We discuss this possibility along with findings for each instrument in greater detail below.

## **MPQ**

The reliability of the MPQ and its component subscales were good overall. We did not find a clear factor structure in the present sample, possibly due to the sample size relative to the number of items. Prior research has obtained slightly different factors with different samples. Empathy and openmindedness sometimes load together on a single factor (van der Zee & van Oudenhoven, 2000; van der Zee, van Oudenhoven, & de Grijjs, 2004), and emotional stability and flexibility have been found to load together (van der Zee et al., 2004). However, in an analysis of a 78-item version of the MPQ, five factors emerged that were generally consistent with the five subscales (Leone et al., 2005).

Results provided some support for the theoretical model as trait-based. Traits should be less sensitive to life events and recent experiences than are more dynamic characteristics. Though life events can certainly shape personality (Caspi, Roberts, & Shiner, 2005), the CQS dimensions and IDI stages are explicitly posited to be responsive to training, development, and experience, whereas the MPQ traits are assumed to be more stable. Consistent with this, the MPQ traits were less likely to correlate with time lived outside the U.S. than were the CQS dimensions or IDI stages. This pattern emerged more clearly in the active-duty sample than in the cadet sample.

The MPQ showed strong relationships among the cultural empathy, openmindedness, and social initiative subscales, as well as moderate to strong relationships among social initiative, flexibility, and emotional stability. This pattern is consistent with previous findings (van Oudenhoven, Mol, & van der Zee, 2003). Emotional stability and flexibility showed smaller

relationships with the other variables and subscales; however, it would be premature to dismiss these subscales as less relevant.

Previous research provides evidence that these two characteristics are important for performance-related outcomes in intercultural settings. In one laboratory study, emotional stability and flexibility formed a single factor, which researchers labeled ‘adaptation’ (van der Zee et al., 2004). This factor related to participants’ responses to an intercultural scenario, in which participants were asked to imagine themselves experiencing a scenario related to international travel. Higher adaptation was associated with lower levels of anxiety and higher feelings of safety, even when the scenario was designed to be stressful (i.e., no English speakers in the environment, no friends to meet at airport, no advance planning).

Emotional stability and flexibility prove to be similarly important in real-world professional settings. Both emotional stability and flexibility were predictive of behavioral competency in an assessment center (van der Zee et al., 2003). Participants were job applicants for a variety of different positions at GITP, an organizational consulting company in the Netherlands and Belgium. Assessment center staff rated these individuals on a variety of behaviors after they completed interviews and written tests, including decisiveness, group leadership, initiative, leadership, judging, persuading, planning/organizing, analyzing problems, cooperating, sensitivity, stress tolerance. In addition, for Western expatriates working in Taiwan, flexibility was the best predictor of job satisfaction/professional adjustment and social adjustment, whereas emotional stability, empathy, and social initiative predicted personal adjustment (van Oudenhoven et al., 2003). Flexibility was also the strongest predictor of interest in and self-perceived aptitude for an international career (van der Zee & van Oudenhoven, 2000).

The MPQ shows promise for use in predicting which individuals are likely to perform and adjust well in intercultural settings. Whether these traits might be responsive to training, education, and other developmental interventions is to be determined. These traits have demonstrated good, but varying, degrees of stability in test-retest correlations over a two-month period (van der Zee & van Oudenhoven, 2000). Research on more global personality traits has shown that growth and change in individual-level traits does occur over time, particularly in young adulthood (Roberts, Caspi, & Moffitt, 2001; Roberts, Walton, & Viechtbauer, 2006). Because these broader traits can change as a function of life experience (Roberts & Mroczek, 2008), it is reasonable to expect some shift in more specific traits like those measured by the MPQ. Whether these traits can be influenced by organizational culture, training and development, or other professional experiences is a question for future research.

## **CQS**

In our findings, there was little distinction among the four CQS subscales in terms of their correlates. If one subscale correlated with another measure or biographical variable, the other three also tended to correlate at similar levels. Exceptions were that behavioral CQ showed a small relationship with IDI Minimization in cadets, and Metacognitive and Motivational CQ were associated with lower levels of IDI Defense/Denial in the active-duty sample, whereas

Cognitive and Behavioral CQ were not. Overall, the CQ subscales tended to show correlations of comparable size with intercultural efficacy, IDI subscales, and MPQ subscales.

Our biographical variables generally showed small to moderate relationships with all CQS subscales – foreign language proficiency, intercultural interactions, and time lived outside the U.S. were all associated with higher CQS scores. These correlations did not show distinctions among CQS dimensions found in previous research. The language variable is one example: only cognitive CQ was related to foreign language skills in a student sample (Shannon & Begley, 2008). However, previous research has also been inconsistent with regard to the CQS's relationship with biographical variables.

For example, in one study, business travel outside of one's home country (termed 'multicultural experiences' in this research) was associated with cognitive CQ but not with other CQS dimensions (Tay, Westman, & Chia, 2008), whereas another study showed that international work experience was related to higher CQ on all subscales *except* for Cognitive CQ (Shannon & Begley, 2008). Similarly, whereas one study found that diversity of social contact (e.g., lived or attended school in other countries) was not predictive of *any* CQS subscales (Shannon & Begley, 2008), another found that the number of nonwork international experiences was associated with *all* CQS subscales (Tarique & Takeuchi, 2008). Future research using the CQS will need to reconcile these inconsistencies.

In predicting cadets' and Soldiers' intercultural efficacy, our findings showed that the CQS mediated the contributions of the MPQ and IDI. In addition to the similarity that the CQS and intercultural efficacy are the most dynamic of the constructs assessed in the present research, the items also share some similarity in their structure, in that both explicitly ask respondents to assess their level of confidence as related to intercultural contact. The size of the correlations between the two measures was not so high that they can be considered the same construct, but they were high enough to indicate considerable overlap between the two.

In the absence of outcome data in our research we must look to previous research for potential implications of the CQS findings for performance or adjustment outcomes. In prior research, motivational CQ has emerged as a good predictor of adjustment outcomes in students (Ward & Fischer, 2008) and expatriate managers (Tay et al., 2008; Temple et al., 2006), as well as predicting behavioral outcomes. In one study, CQS scores in negotiating dyads predicted integrative behavioral sequences, which led to improvements in joint gain (Imai & Gelfand, 2010). CQS subscales have also been shown to predict cultural judgment and decision making and performance on a problem-solving task (Ang et al., 2007).

However, other research has shown that the CQS does not contribute much explanatory power to intercultural adjustment beyond that of MPQ traits (Ward et al., 2009). One exception may be Motivational CQ, as Ward and Fischer (2008) found partial support for Motivational CQ as a mediator of the relationship between the MPQ and sociocultural adjustment.

Our findings showing very little distinction among correlates with the various CQS subscales, along with the inconsistencies in previous research, prompt reconsideration of the conceptual foundations of the CQS. Cultural intelligence is based on notions of intelligence as a

set of abilities (Sternberg, 1988; 2009) and has been defined as “a person’s capability to adapt effectively to new cultural contexts” (Early & Ang, 2003). Cultural intelligence is proposed to be related to, but distinct from social and emotional intelligences. Evidence that the CQS is an adequate measure of this construct is lacking.

Research has provided mixed evidence of the distinction of cultural intelligence from emotional intelligence (EQ). Data from Ward et al. (2009) could not distinguish them, but findings from Kim, Kirkman, & Chen, 2008, did. However, EQ was significantly correlated with all CQS subscales (Kim et al.), and both studies used self-report scales of emotional intelligence, which may suffer similar weaknesses in construct validity as the CQS. It has been argued that, as an ability, emotional intelligence should not be measured with self-report (Mayer, Caruso, & Salovey, 2000; Wilhelm, 2004), and research suggests that self-report measures assess something more akin to personality traits than to abilities (Brannick, Wahi, Arce, Johnson, Nazian, & Goldin, 2009; MacCann, Matthews, Zeidner, & Roberts, 2003). Evidence has shown that the CQS measures something other than, or in addition to, global personality traits, but it is unclear exactly what that is.

Researchers have argued that a multi-method approach to assessing cultural intelligence is required (Thomas et al., 2008, Ward & Fischer, 2008), as self-report provides only a limited and potentially inaccurate picture (Gelfand, Imai, & Fehr, 2008). Measurement conditions may not be favorable for accurate responding (as participants may have had little experience evaluating their knowledge or behavior in this domain, little direct feedback, or no objective way to determine accuracy) (Mabe & West, 1982). Other research provides conflicting conclusions about the accuracy of self-report assessments as measures of respondents’ mental ability (Paulhus, Lysy, & Yik, 1998), emotional ability (Brackett, Rivers, Shiffman, Lerner, & Salovey, 2006), and knowledge (Ackerman, Beier, & Bowen, 2002).

The CQS seems particularly at risk of measuring with accuracy only the states associated with intermediate levels of expertise – in Howell’s language (1982), the conscious incompetent and the conscious competent. At the more extreme levels, the unconscious incompetent and unconscious competent, individuals may be unlikely to have sufficient awareness to rate themselves accurately (Gelfand et al., 2008). There is a clear need for performance-based testing methods to address intercultural abilities.

A further challenge for the self-report approach of the CQS is that, due to the transparency of the items, responses may reflect social desirability and other biases. To date, the literature has reported findings from respondents are only research participants who likely have little motivation to report biased or inaccurate responses. If used in a Soldier population or in a training context, respondents may be more motivated to present themselves in a positive light, and the CQS provides no mechanism to reduce this problem or identify the extent to which responses might reflect biases. Research on emotional intelligence has shown that self-report measures are more susceptible to faking than performance-based measures (Day & Carroll, 2008), and that only performance-based measures predict actual behavior (Brackett et al., 2006). These findings suggest caution is warranted when using the CQS in military and other organizational settings.

In general, the existing literature and current findings suggest that the CQS measures something relevant and useful, but does not adequately reflect the underlying theory. Exactly what it measures is still unclear. The CQS may be a useful research tool for predicting adjustment and performance in intercultural settings, but caution is needed when using it, due to the potential for both intentional and unintentional biases in responding.

## **IDI**

Results for the IDI stages were somewhat mixed. Correlations among the IDI subscales were different in our two samples. Because Defense/Denial and Acceptance/Adaptation are on opposite sides of the developmental continuum in the DMIS theory, one might expect them to be negatively correlated. Cadets showed this pattern to some extent, showing a small tendency to endorse lower levels of Defense/Denial as they reported higher scores on Acceptance/Adaptation. However, in the active-duty sample, these subscales were unrelated. It is unclear why ethnocentric and ethnorelative views would be independent from each other in the active-duty participants.

In addition, contrary to what we expected, with the exception of Acceptance/Adaptation, the IDI subscales did not correlate with cognitive CQ in either sample. It is not clear whether the lack of association is due to the cognitive CQ measuring some aspect of cognitive orientation different from the IDI, or if it is due to the IDI not measuring cognitive orientation as proposed.

We also found the Reversal subscale to be problematic, as the DMIS does not provide clear predictions about Reversal. Reversal is considered a variant of Defense, but lacks the negative view of other cultures that is characteristic of Defense (Bennett, 2004). Reversal is unlike the other three IDI stages that we included in that not everyone experiences Reversal. Thus, it is unclear how this subscale relates to the other stages and how it should relate to other scales. In our results, Reversal was associated with higher Defense/Denial in active-duty participants, but not in cadets.

In comparing patterns obtained for the two samples, Defense/Denial, Reversal, and Minimization showed different patterns of correlations, whereas Acceptance/Adaptation was more consistent across the two samples. The DMIS proposes that “individuals with more complex cultural categories are better able to navigate through cultural differences” (Hammer et al., 2003). However, only the stage of Adaptation in the DMIS addresses abilities (e.g., empathy, Hammer et al., 2003) or directly includes affect and behavior (Bennett, 2004).

This conceptual approach suggests that only the Acceptance/Adaptation subscale of the IDI may be useful for predicting responses to an intercultural environment. In both samples, Acceptance/Adaptation correlated with all subscales of the CQ, with MPQ empathy and openmindedness, and with the biographical variables of intercultural interaction and language proficiency. Defense/Denial also showed relationships in the expected direction with some biographical variables.

Minimization generally did not relate to other subscales or variables, except that it correlated negatively with time lived outside the U.S. in cadets, but positively in active-duty Soldiers. Its mid-level position in the developmental model of intercultural sensitivity suggests that perhaps minimization is a rather neutral orientation that represents a transition from ethnocentric to ethnorelative views. However, the minimization of cultural differences may be helpful in some circumstances. Caligiuri and Tarique (2009) have proposed that working in a foreign culture requires different orientations depending on the situation. Cultural minimalism can be a useful orientation where cultural considerations can or should be subordinate to other norms or concerns (e.g., in following organizational rules and procedures), whereas other situations may call for adaptation to cultural differences or for the integration of different cultural perspectives. In this view, minimization would not be a stage to be overcome on the way to adaptation, but instead may be a useful tool in one's cultural repertoire, in addition to adaptation.

Research has not addressed the predictive validity of the IDI. More typically, research has used the IDI as an outcome measure for evaluating study abroad programs (e.g., Pederson, 2010) or examined the structure of the IDI. In one study examining the structure of the IDI, the two subscales of DD and AA emerged clearly when the instrument was administered cross-culturally, whereas the other subscales did not. Study abroad and domestic intercultural interventions have been shown to impact students' intercultural development as measured by the IDI (Anderson et al., 2006; Brooks, 2005), but it remains unclear what implications those shifts may have for functioning in an intercultural environment. The available literature and our present findings suggest that, for researchers interested in assessing attributes linked with intercultural outcomes, the IDI may not be the best choice, though further research on the acceptance/adaptation and defense/denial subscales may be warranted.

## **Conclusions and Future Directions**

Of the three measures we included in this research, the MPQ held up the best in terms of reflecting the underlying theory, and previous research has shown that it predicts both intercultural adjustment and performance outcomes, suggesting that it might be a useful tool in determining which personnel are likely to adapt successfully in other cultures. Further research should examine the extent to which these traits can be influenced through training and other developmental interventions.

Though none of the three measures is clearly appropriate for training and development purposes at this time, each has some utility and can be useful in limited circumstances. All of these measures share a method in that they rely exclusively on self-report, which may not provide a valid assessment of some aspects of cross-cultural competence. As self-report instruments, the IDI and MPQ are relatively more promising for use with military personnel, as the items are less transparent and therefore less likely to elicit biases in respondents.

One major limitation of the present research was that we were unable to assess intercultural outcomes. Though our intercultural efficacy items had good reliability and seemed to assess a common construct, they did not provide a very good proxy outcome measure of either adjustment or performance. In addition, our samples may not have provided good representation



of Army personnel. The cadets may represent a unique population at USMA, as they were already studying a foreign language and many were either embarking on or had completed study abroad. Therefore, range restriction to cadets with intercultural interests is possible. Furthermore, our active-duty sample included a disproportionate number of intelligence personnel, which may not be representative of the Army as a whole. As a result, some of the relationships reported here may differ in a more representative Army sample, and comparisons between subgroups in the sample should be made with caution.

Causal relationships cannot be inferred from the present research. Interaction with members of other cultures and foreign language proficiency were both related to intercultural characteristics; however, we cannot determine the direction this relationship. Although evidence shows that intergroup contact can reduce prejudice and increase empathy and perspective taking (Pettigrew & Tropp, 2006, 2008), in the present research, it may be that individuals who were already higher in intercultural characteristics were simply more likely to seek out opportunities to interact. Similarly, previous research on foreign language study provides suggestive, but inconclusive evidence about the potential role of foreign language learning in developing intercultural knowledge, skills, and attitudes (see Abbe, 2008, for a review). Future research should further examine the impact of intergroup contact and other intercultural experiences on developing cross-cultural competence. A variety of methods, including longitudinal research designs, comparison groups, and other methods, will be helpful in determining what experiences provide the best opportunities for acquiring cross-cultural competence.

Future research should also attend more to the cognitive and behavioral intercultural attributes. Existing measures seem to place relatively more emphasis on the motivational and affective aspects of cross-cultural competence, perhaps due to reliance on self-report. Development of assessment methods other than self-report is greatly needed to measure culture-general skills, abilities, and knowledge. Although self-report of traits can provide predictive utility in determining who is likely to perform better in their job functions, even when response biases distort self reports (Barrick & Mount, 1996), trait measures provide an incomplete picture of cultural learning and development.

Current research into Soldiers' cross-cultural competence is pursuing two alternative methods. In one measure, scenario-based methods are used to assess Soldiers' development in five aspects of cross-cultural competence: cultural maturity, interpersonal skills, cognitive flexibility, cultural acuity, and cultural knowledge (McCloskey, Behymer, Papautsky, Ross, & Abbe, in preparation). In another effort, researchers are developing a conceptual mapping method to assess a schema for cultural understanding (Rentsch, Mot, & Abbe, 2009). This method asks Soldiers to provide relatedness ratings for a set of cultural attributes, cultural learning techniques, and mission-oriented goals for cultural learning. This approach represents one method to assess culture-general knowledge structures without reliance on self-report, ultimately providing an assessment tool to indicate a Soldier's level of cultural expertise.

Moving beyond exclusive reliance on self-report for assessing cross-cultural competence is necessary to support cultural training, education, and development efforts. Though initial efforts into alternative methods are promising, further research is needed to provide assessments that are tailored to the cultural learning outcomes of interest to the Army. The measures used in

the present research provide some utility for identifying individuals who are more and less likely to be successful in intercultural settings, but evidence does not yet support their use for purposes other than research. In particular, research is needed to determine what predicts mission performance and deployment adjustment in military personnel.

Identifying the important culture-related performance outcomes is a critical next step. Specifying the activities required to perform missions effectively in a foreign culture or multinational setting will guide further research into the best methods and tools for assessing the individual characteristics needed for those activities. Whether used for selection and assignment or training and development interventions, developing and validating metrics for cross-cultural competence and related capabilities must have these mission performance demands as the ultimate aim.

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## Appendix A

### *Factor Loadings for Principal Factors Extraction of CQS with Varimax Rotation with Eigen Values > 1*

	1	2	3	4
CQmc2	.75			
CQbeh2	.74			
CQmc4	.73			
CQmc3	.71			
CQmc1	.71			-.34
CQmot3	.68			
CQcog6	.66	.30		
CQbeh1	.66			
CQmot1	.66	-.36	.36	
CQbeh3	.65			
CQmot4	.63		.30	
CQmot5	.63			
CQmot2	.62	-.30	.31	
CQbeh4	.61			
CQcog3	.61	.56		
CQbeh5	.59			
CQcog4	.58	.38		
CQcog2	.55			
CQcog5	.55			
CQcog1	.53	.51		

Note. Only variable loadings  $\geq .30$  have been included.

## Appendix B

### *Factor Loadings for Principal Factors Extraction of CQS with No Rotation with Four Factors Forced*

	Behavioral CQ	Motivational CQ	Cognitive CQ	Metacognitive CQ
CQbeh2	.76			
CQbeh3	.60			
CQbeh4	.58			
CQmc3	.58	.36		
CQbeh1	.57			
CQbeh5	.54			
CQmc4	.48	.41		.33
CQmot1		.78		
CQmot2		.70		
CQmot4		.70		
CQmot3		.54		.34
CQmot5		.51		
CQcog3			.74	.32
CQcog1			.70	
CQcog4			.68	
CQcog6	.33		.61	
CQcog5		.35	.49	
CQmc1	.37			.66
CQcog2			.39	.53
CQmc2	.47	.40		.49

Note. Only variable loadings  $\geq .30$  have been included.

## Appendix C

### *Factor Loadings for Principal Factors Extraction of CQS with Varimax Rotation with Three Factors Forced*

	Behavioral CQ & Metacognitive CQ	Cognitive CQ	Motivational CQ
CQbeh2	.69		
CQbeh4	.66		
CQmc2	.66		.35
CQmc3	.61		.35
CQbeh1	.61		
CQmc1	.61	.36	
CQbeh3	.60		
CQmc4	.59		.38
CQbeh5	.48		
CQcog3		.79	
CQcog1		.73	
CQcog4		.66	
CQcog6	.32	.61	
CQcog2	.42	.46	
CQcog5		.45	.38
CQmot1			.78
CQmot2			.70
CQmot4			.69
CQmot3	.44		.49
CQmot5	.41		.48

Note. Only variable loadings  $\geq .30$  have been included.

# Appendix D

*Factor Loadings for Principal Factors Extraction of MPQ with Varimax Rotation with Five Factors Forced*

	Cultural Empathy	Factor 2	Social Initiative	Flexibility	Emotional Stability
MPQ86_ce	.802				
MPQ8_ce	.639				
MPQ14_ce	.576	.372			
MPQ17_ce	.565				
MPQ89_ce	.554				
MPQ70_ce	.535				
MPQ62_op	.534	.471			
MPQ82_ce	.533				
MPQ68_ce	.520				
MPQ66_op	.509	.344			
MPQ13_op	.503	.373			
MPQ39_si	.494		.324		
MPQ31_ce	.494				
MPQ58_op	.494	.459			
MPQ51_ce	.491				
MPQ80_ce	.480				
MPQ64_ce	.479				
MPQ71_ce	.456				
MPQ63_ce	.424				
MPQ35_op	.395				
MPQ77_op	.393	.328			
MPQ52_es	.338	.322			
MPQ84_op	.303				
MPQ45_ce					
MPQ79_op					
MPQ46_ce					
MPQ88_flex		.585			
MPQ90_flex	.337	.579		.335	
MPQ81_op		.548			
MPQ47_si		.541			
MPQ54_op	.419	.496			
MPQ74_op		.491			
MPQ59_op		.486			
MPQ2_si		.485	.404		

MPQ73_op	.388	.477		
MPQ36_es		.472		.318
MPQ78_op	.434	.464		
MPQ10_op	.396	.459		
MPQ12_flex		.428		
MPQ20_op		.426		
MPQ85_flex		.394		
MPQ29_si		.389		
MPQ76_es		.327		
MPQ11_flex		.316		
MPQ87_op				
MPQ42_flex				
MPQ1_flex				
MPQ61_ce				
MPQ27_op				
MPQ25_si		.313	.669	
MPQ24_si			.609	
MPQ9_si			.596	
MPQ38_es			.562	
MPQ7_si			.557	
MPQ4_si			.538	
MPQ40_si			.536	
MPQ65_es			.529	.369
MPQ18_si			.522	
MPQ34_si	.385		.506	
MPQ48_si		.412	.481	
MPQ26_si			.470	
MPQ41_si			.428	
MPQ49_si			.414	
MPQ60_ce	.318	.304	.354	
MPQ28_es				
MPQ50_flex				.616
MPQ91_flex				.607
MPQ83_flex				.594
MPQ22_flex				.586
MPQ56_flex				.583
MPQ37_flex				.569
MPQ43_flex				.536
MPQ32_flex				.464
MPQ16_flex				.339

MPQ21_flex			.303
MPQ19_flex			
MPQ69_es			.585
MPQ75_es	.410		.549
MPQ67_es			.532
MPQ53_es			.505
MPQ33_es			.493
MPQ23_es			.488
MPQ5_es			.436
MPQ72_es			.427
MPQ3_es	.362		.418
MPQ55_es			.372
MPQ6_es			.349
MPQ44_es			.339
MPQ30_si	.327		.327
MPQ15_es			.313
MPQ57_es			.311

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*Note.* Only variable loadings  $\geq .30$  have been included.

# Appendix E

*Factor Loadings for Principal Factors Extraction of IDI with Varimax Rotation with Eigen Values > 1*

	1	2	3	4	5	6	7	8	9	10	11	12
IDI_AA12	.68											
IDI_AA9	.62										.54	
IDI_AA6	.61											
IDI_AA4	.61											
IDI_AA5	.56										.45	
IDI_AA14	.53						.36		.31			
IDI_AA7	.51								.32			
IDI_AA11	.49											
IDI_AA8	.46											
IDI_AA10	.42									.33		
IDI_R2		.65										
IDI_R3		.64							.38			
IDI_R4		.61										
IDI_R9		.59										
IDI_R7		.56										
IDI_R8		.55										
IDI_R1		.53										
IDI_R5		.47										
IDI_R6		.42										
IDI_DD10			.75									
IDI_DD4			.68									
IDI_DD9			.55									
IDI_DD6			.50									

[illegible]



# Appendix F

## *Factor Loadings for Principal Factors Extraction of IDI with Varimax Rotation with Four Factors Forced*

	Acceptance/ Adaptation	Defense/ Denial	Reversal	Minimization
IDI_AA14	.63			
IDI_AA5	.63			
IDI_AA12	.63			
IDI_AA9	.62			
IDI_AA10	.61			
IDI_AA13	.59			
IDI_AA11	.57			
IDI_AA3	.56			
IDI_AA6	.55			
IDI_AA7	.50			
IDI_AA4	.48			
IDI_AA1	.45			
IDI_AA2	.44			
IDI_AA8	.43			.33
IDI_DD10		.63		
IDI_DD12		.61		
IDI_DD5		.59		
IDI_DD6		.57		
IDI_DD4		.57		
IDI_DD9		.56		
IDI_DD11		.49		
IDI_DD7		.47		
IDI_DD3		.46		
IDI_DD13		.42		
IDI_DD8		.40		
IDI_DD2		.39		
IDI_DD1				
IDI_R2			.66	
IDI_R4			.60	
IDI_R3			.58	
IDI_R9			.57	
IDI_R8			.56	
IDI_R7			.55	

IDI_R1		.51	
IDI_R5		.44	
IDI_R6		.41	
IDI_M6			.64
IDI_M8			.62
IDI_M5			.61
IDI_M4	-.33		.55
IDI_M9			.55
IDI_M1			.51
IDI_M7			.46
IDI_M2			.41
IDI_M3			.38

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*Note.* Only variable loadings  $\geq .30$  have been included.

# Appendix G

## *Factor Loadings for Principal Factors Extraction of IDI with Varimax Rotation with Three Factors Forced*

	Acceptance/ Adaptation	Defense/Denial & Reversal	Minimization
IDI_AA12	.64		
IDI_AA14	.63		
IDI_AA10	.61		
IDI_AA13	.61		
IDI_AA9	.60		
IDI_AA5	.59		
IDI_AA11	.58		
IDI_AA3	.55		
IDI_AA6	.54		
IDI_AA7	.49		
IDI_AA4	.49		
IDI_AA1	.48		
IDI_AA8	.42		.33
IDI_AA2	.41		
IDI_DD1			
IDI_DD6		.59	
IDI_DD12	-.30	.52	
IDI_DD9		.50	
IDI_R4		.50	.33
IDI_DD3		.50	
IDI_DD5		.50	
IDI_R6		.49	
IDI_DD11		.49	
IDI_R9		.47	
IDI_R2		.45	
IDI_R3		.45	
IDI_R8		.44	.31
IDI_DD7		.43	
IDI_DD13		.41	
IDI_R5		.41	
IDI_R7		.39	
IDI_DD4		.38	
IDI_DD10		.37	

IDI_DD8	.33	
IDI_R1	.33	
IDI_DD2	.31	
IDI_M5		.64
IDI_M6		.60
IDI_M4		.59
IDI_M8		.56
IDI_M9		.53
IDI_M1		.51
IDI_M7		.46
IDI_M2		.39
IDI_M3		.35

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*Note.* Only variable loadings  $\geq .30$  have been included.

## Appendix H

### *Factor Loadings for Principal Factors Extraction of IDI with Varimax Rotation with Two Factors Forced*

	Acceptance/ Adaptation	Defense/Denial & Reversal
IDI_AA12	.64	
IDI_AA9	.58	
IDI_AA14	.57	
IDI_AA13	.54	
IDI_AA6	.54	
IDI_AA5	.53	
IDI_AA10	.53	
IDI_AA11	.52	
IDI_AA8	.51	
IDI_AA7	.51	
IDI_AA4	.51	
IDI_AA3	.48	
IDI_AA1	.43	
IDI_AA2	.40	
IDI_M4	.36	
IDI_M8	.31	
IDI_M5	.31	
IDI_DD1		
IDI_M1		
IDI_M9		
IDI_M7		
IDI_M6		
IDI_DD6		.56
IDI_R4		.53
IDI_R6		.51
IDI_DD3		.49
IDI_R9		.49
IDI_DD12	-.39	.49
IDI_DD9		.48
IDI_R8		.47
IDI_R3		.47
IDI_DD11		.47
IDI_R2		.46

IDI_DD5	.46
IDI_R5	.43
IDI_R7	.41
IDI_DD7	.39
IDI_DD13	.38
IDI_DD4	.35
IDI_R1	.35
IDI_DD10	.35
IDI_DD8	.31
IDI_DD2	
IDI_M2	
IDI_M3	

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*Note.* Only variable loadings  $\geq .30$  have been included.